

**REMARKS**

Claims 1-29 are currently pending in the application. By this amendment, claims 1 and 17 were amended, and claim 3 was canceled. The above amendment does not add new matter to the application and is fully supported by the specification. Reconsideration and withdrawal of all pending rejections in view of the following remarks is respectfully requested.

***Allowable Subject Matter***

Applicants appreciate the indication that claims 16-18, 21-29 are allowed.

***35 U.S.C. § 103 Rejection***

Claims 1 and 4-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over applicant's admitted prior art ("AAPA") of the instant application in combination with NAYAK (U.S. U. S. Patent No. 6,353,861). This rejection is respectfully traversed.

The Examiner asserts that AAPA shows all of the features of the claimed invention except forming source and drain extension regions in the upper surface of substrate and providing a vacancy-trapping element by implanting a noble gas or nitrogen into the source and drain extension regions. Applicants traverse the Examiner's assertions.

Applicants amended independent claim 1 recites in pertinent part:

"...wherein the step of reducing vacancy concentration comprises providing a vacancy-trapping element of one of F, Xe, Ar, He, Kr or a noble gas element in the source and drain extension regions..."

Applicants submit that no proper combination of AAPA and NAYAK render obvious the above-noted features of claims 1 and 4-15.

As acknowledged by the Examiner, AAPA does not show all of the features of the claimed invention. In particular, as AAPA discloses a method for manufacturing a semiconductor device, including the steps of forming source and drain regions, this document fails to teach or suggest *reducing vacancy concentration that includes providing a vacancy-trapping element of one of F, Xe, Ar, He, Kr or a noble gas element in the source and drain extension regions*, as claimed in at least independent claim 1.

The Examiner asserts that NAYAK teaches the deficiencies of AAPA, and that it would have been obvious to modify the AAPA to include these features of NAYAK.

Applicants note, NAYAK discloses nitrogen implantation in a conventional n-type dopant (e.g., Arsenic or Phosphorus), resulting in a transistor having low series resistance and no significant increase in source and drain extension overlap. (See Abstract of NAYAK) However, Applicants note that NAYAK fails to teach or suggest any other element that would provide the desired results of nitrogen, and contrary to the Examiner's assertions, certainly fails to teach or suggest the use of fluorine or a noble gas, as recited in the claims.

As neither applied document teaches or suggests the above-noted features of at least independent claim 1, Applicants submit that no proper combination of these documents can render unpatentable the combination of features recited in the pending claims.

Thus, even assuming, arguendo, that it would have been obvious to modify the AAPA with NAYAK, (which Applicants submit it would not), the resulting combination, at best, would utilize nitrogen implantation, which is not recited in the present claims. As a result, the asserted combination of the AAPA and NAYAK would not teach or suggest that

*the step of reducing vacancy concentration comprises providing a vacancy-trapping element of one of F, Xe, Ar, He, Kr or a noble gas element in the source and drain extension regions, as claimed in at least independent claim 1.*

Further, Applicants respectfully disagree with the Examiner's assertions that it would have been obvious to modify the teachings of AAPA with those of NAYAK.

A § 103 rejection requires the Examiner to first establish a *prima facie* case of obviousness: "The Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the Examiner does not produce a *prima facie* case, the Applicants are under no obligation to submit evidence of nonobviousness." MPEP 2142. The Court of Appeals for the Federal Circuit has set forth three elements which must be shown for *prima facie* obviousness:

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teachings or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Applicants submit that a *prima facie* case of obviousness has not been established because neither the AAPA nor NAYAK provide any teaching or suggestion that it would have been obvious to replace the Nitrogen implantation with one of Fluorine or a noble gas element. Thus, Applicants submit that the only reasonable rationale for modifying the applied art in the manner asserted by the Examiner is through the use of improper

hindsight after reviewing Applicants disclosure and claims.

Moreover, as NAYAK merely discloses the use of nitrogen, and provides no teaching or suggestion of using fluorine or a noble gas, Applicants submit that the art of record fails to provide the requisite motivation or rationale for combining the AAPA and NAYAK in any manner that would render claim 1 obvious.

For these reasons, Applicants respectfully submit that claim 1 is allowable over any proper combination of NAYAK and AAPA. Claims 4-15 are also allowable over NAYAK and AAPA at least because of their dependency from allowable base claim 1, and because these claims further define the invention over the art of record. Therefore, withdrawal of the rejection of claims 1 and 4-15 are respectfully requested.

**CONCLUSION**

In view of the foregoing amendments and remarks, Applicants submit that all of the rejections have been overcome, and that the claims are patentably distinct from the prior art of record and in condition for allowance. The Examiner is respectfully requested to pass the above application to issue, and to contact the undersigned at the telephone number listed below, if needed.

Respectfully submitted,  
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